

Carnegie Mellon

Psychological Stress and Disease: Implications for the Gulf Oil Spill

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- How does stress **get under the skin**?
- What do we know about stress and health that will inform us about the Gulf spill?
 - **What types of stressful events** associated with disease risk?
 - **Which diseases** are likely affected?
 - **Who** is most likely to be affected?
- Recommendations
 - Which endpoints should be monitored?
 - What kinds of studies are needed?

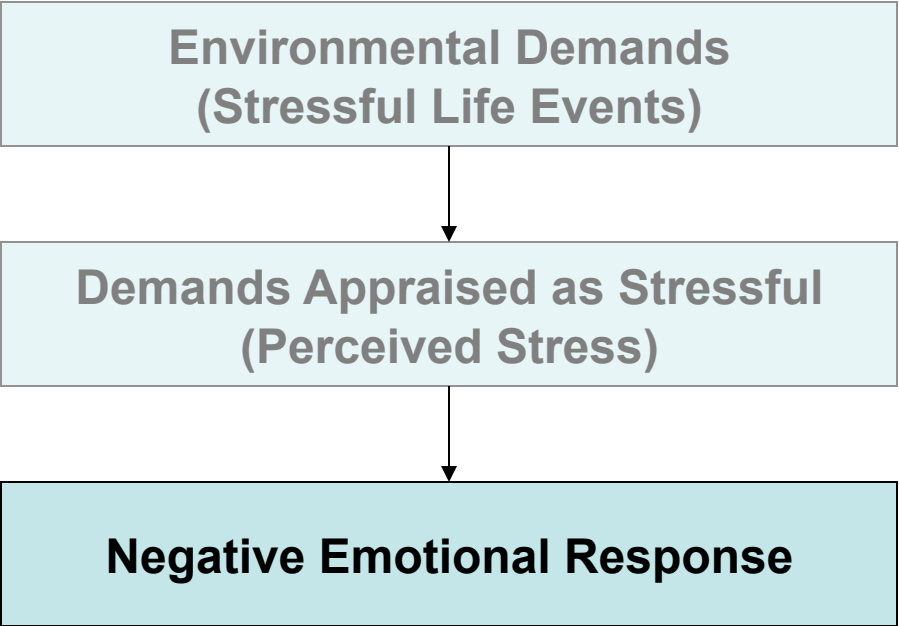
How does stress get “under the skin”?

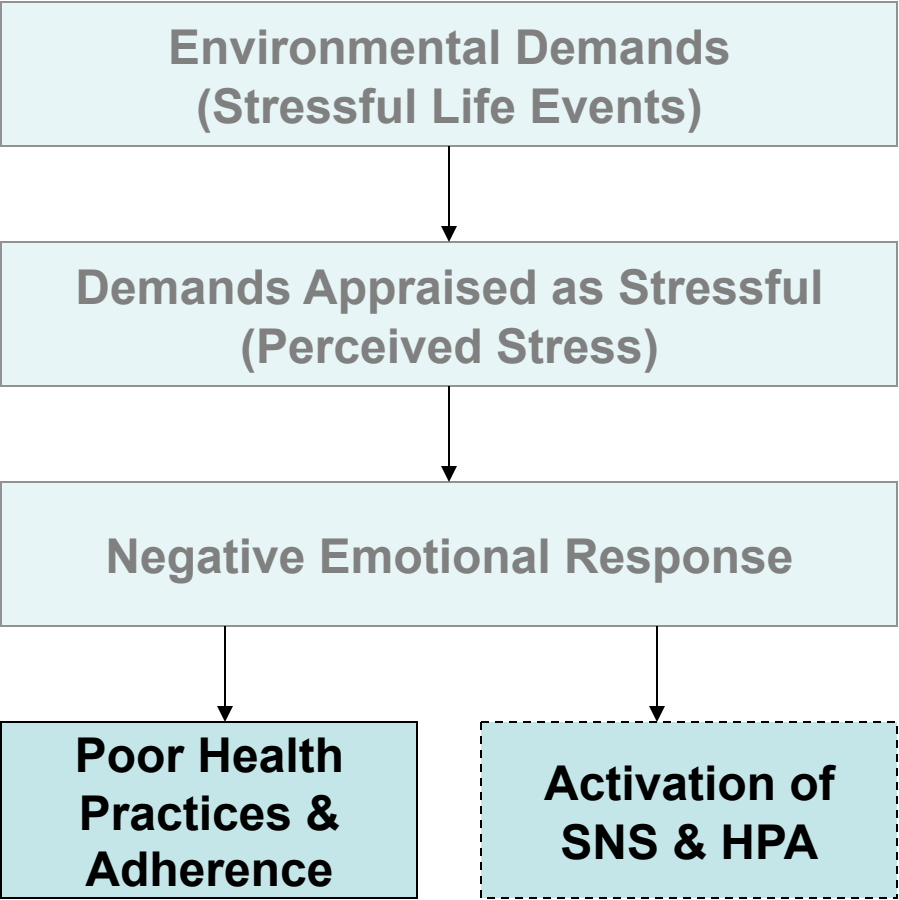
**Environmental Demands
(Stressful Life Events)**

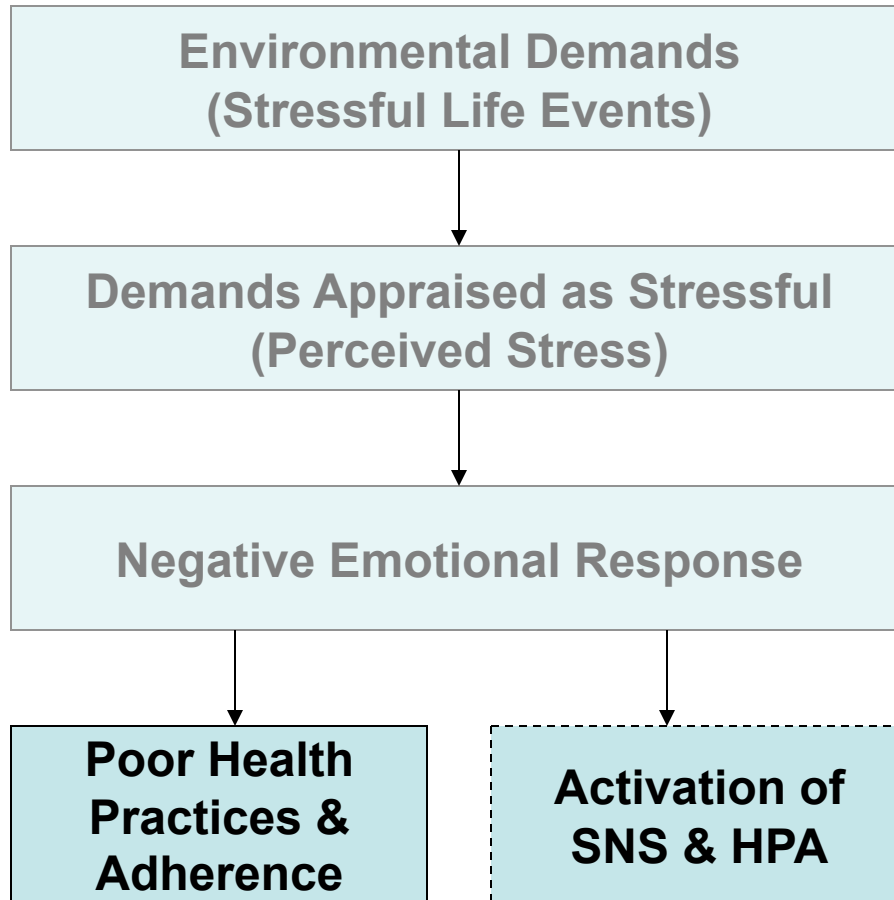
**Environmental Demands
(Stressful Life Events)**



**Demands Appraised as Stressful
(Perceived Stress)**

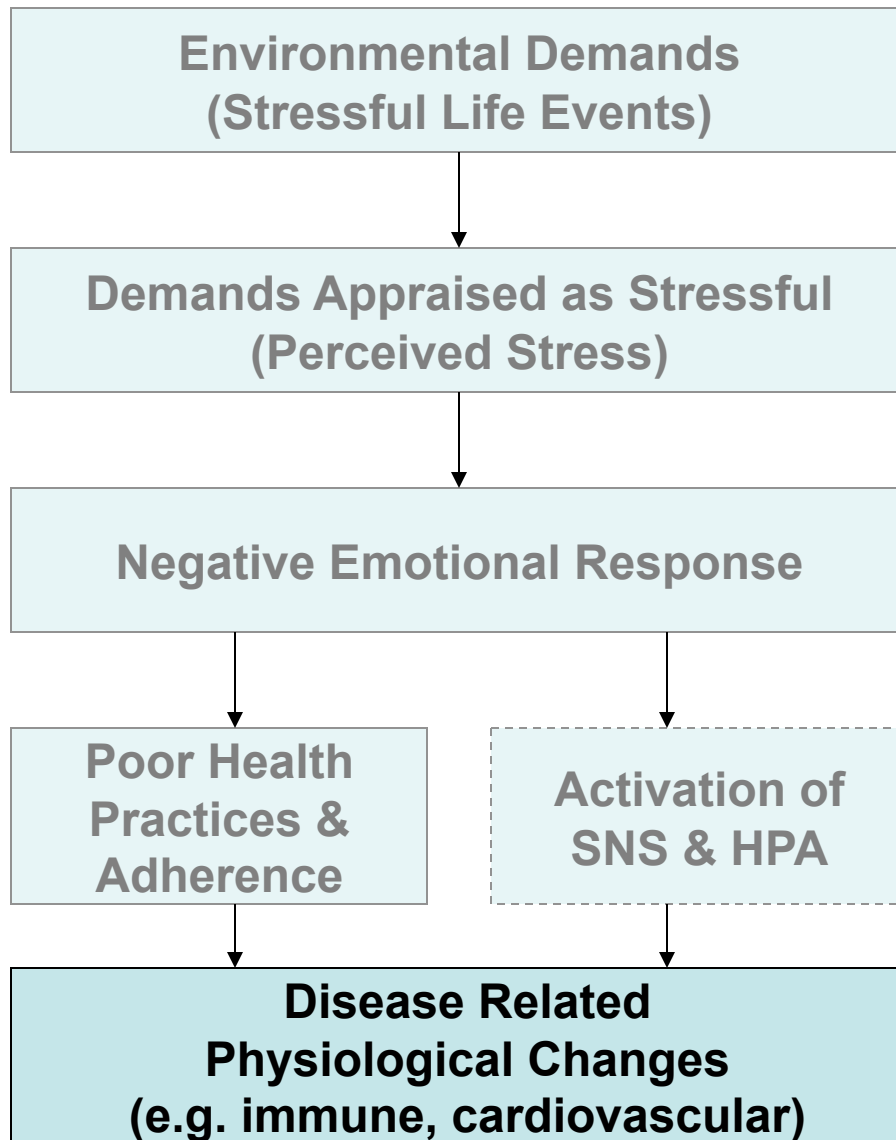


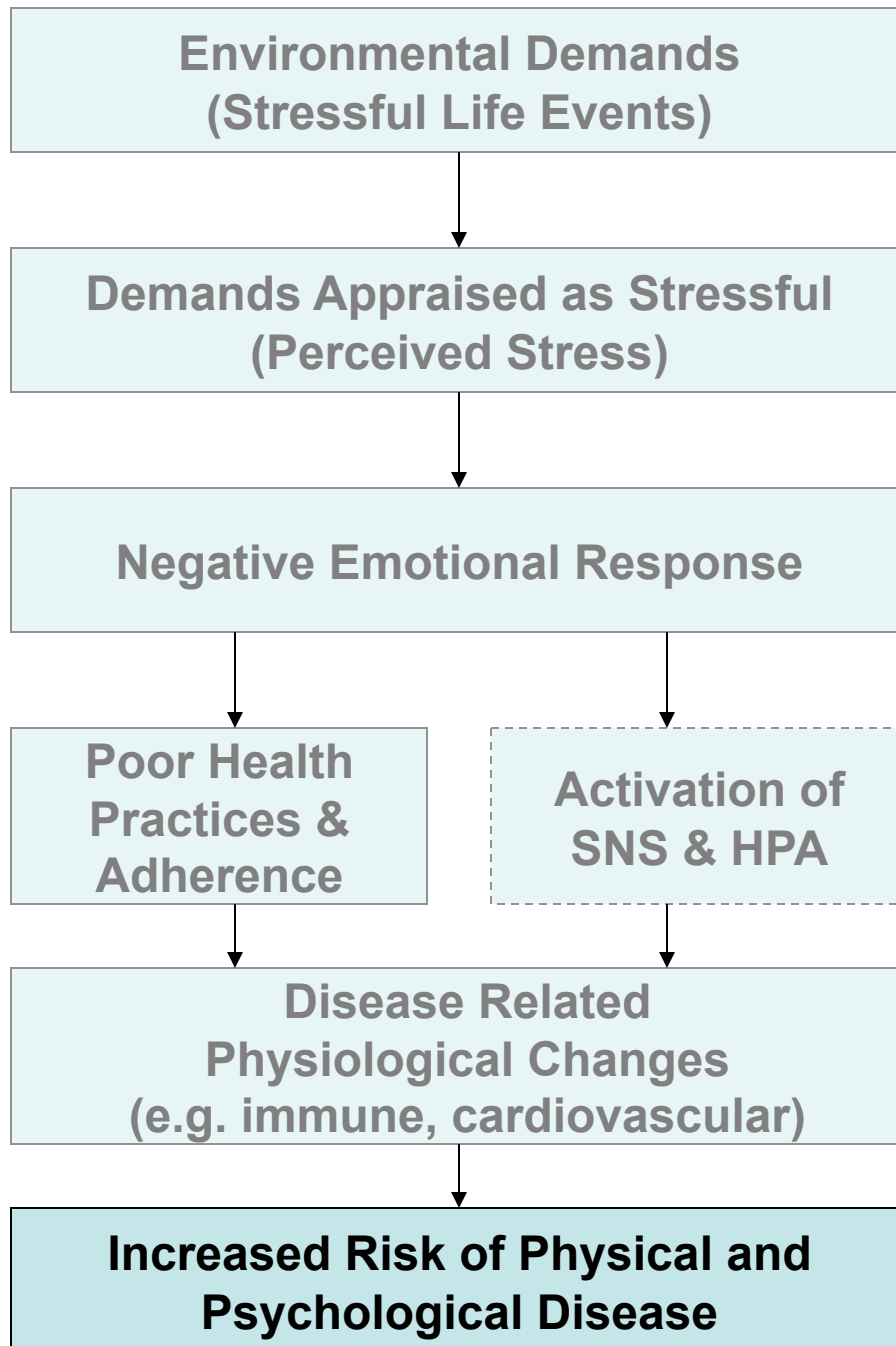


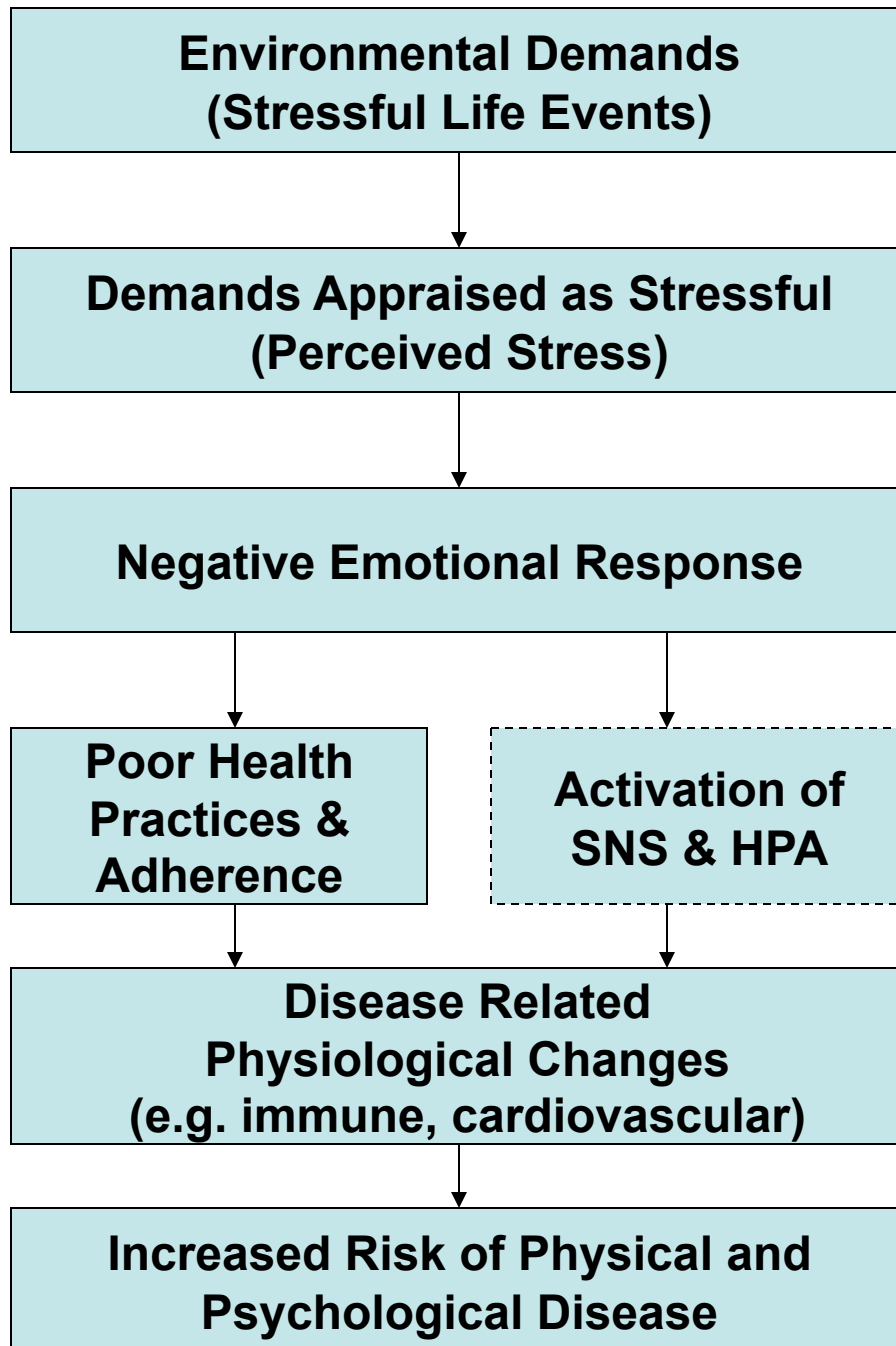


- SLEEP
- DIET
- ACTIVITY
- ALCOHOL & DRUG USE

- ADHERENCE







***What do we know about
stress and health....***

that can inform us of risks
associated with the Gulf Spill?

**The kinds of stressful events
associated with disease risk....**

*Are the same kinds that we
associate with the events
surrounding the Gulf Oil Spill*

- Threats to ***self-esteem*** (job loss)
- Threat or loss of ***purpose and meaning*** in life (career aspirations, family businesses)
- Loss of feelings of ***control*** over important outcomes (supporting families, protecting environment)
- Perceptions of ***unfair treatment*** (reimbursement for loss)
- Damage to ***social networks*** (loss of close others, conflict within family and network)

Which diseases?

Stress and Mental Health

Adults

Depression

Post Traumatic Stress Disorder (PTSD)

Anxiety Disorders

Seeking Care for Mental Health Problems

Children

Emotional and Social Conflicts

Seeking Care for Mental Health Problems

Stress and Physical Health

Seeking Medical Care
Total Mortality

Disease Incidence (onset in healthy people)

Coronary Heart Disease

(Myocardial Infarction, Cardiac Arrhythmia and Sudden Death)

Hypertension

Upper Respiratory Infections

(includes children)

Stress and Physical Health

Exacerbations of Chronic Diseases

HIV/AIDS progression among HIV+ men

Oral and Genital Herpes Exacerbations

Rheumatoid Arthritis Flare-ups

Asthma Exacerbations (includes children)

Examples from Heart Disease

Risk for CHD

Risk for Myocardial Infarction
 Cardiac Arrhythmia
 Sudden Death

Have been found to Increase following

- **9/11** (cardiac arrhythmias w/in 30 days/Florida)
- **SCUD Missile Attacks** (MI & Sudden Death w/in 60 days after attack)

Risk for CHD

Work Stressors Are Associated
with risk for CHD and Hypertension
(6 months to several years later)

When They Involve:

- Perceived *lack of control* over work
- Perceived *lack of institutional fairness*

Which populations are most
vulnerable to stress-associated
risk?

- People with chronic illnesses
- Lower levels of income and education
- Lack close social ties
- Histories of poor coping
- Children (including stress-transmission)

Recommendations

What endpoints should we monitor in the Gulf oil spill?

PATHWAYS TO DISEASE:

- Perceptions of Stress/threat
- Feelings of depression, anxiety and anger
- Sleep quality
- Diet
- Physical Activity (and weight/height)
- Smoking
- Alcohol and Drug Use
- Adherence to Medical Regimens

DISEASE OUTCOMES:

- Utilization of health care
- Incident cases of depression, anxiety, & PTSD
- Cardiovascular Risk and Incidence of Disease (particularly hypertension, MIs)
- Markers of disease progression among chronically ill (e.g., HIV+, Asthmatics)

How should these data be collected?

- Longitudinal long-term individual follow-up of (at least high risk) subjects with special emphasis on
 - Mental health
 - Cardiovascular disease
 - And progression and exacerbation of existing chronic diseases